

QUARTERLY

LOS ANGELES COUNTY MUSEUM

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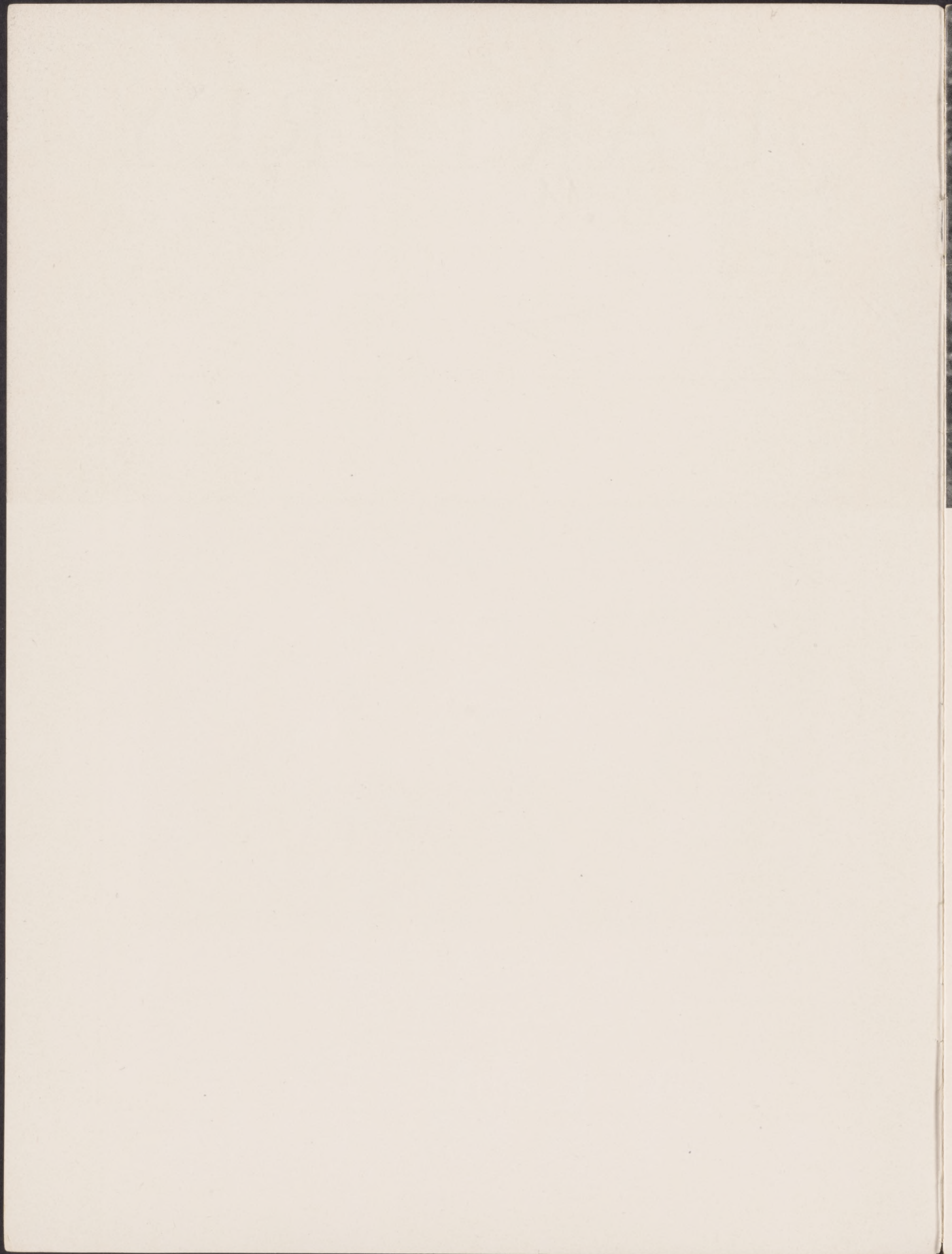
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PICTOGRAPH: WHITE HORSEMAN WITH LANCE—Painted *circa* 1830-40 in Canyon del Muerto, Arizona. Attributed to the Navajo artist Little Sheep.

Length 34 inches.





PICTOGRAPH: COMPANION TO THE FIGURE ON THE FRONT COVER.

ANCIENT ARTISTS OF THE SOUTHWEST

Hidden in secluded canyons of the Southwest, particularly in New Mexico, Arizona, Utah and Colorado, are hundreds of sites once occupied by prehistoric tribesmen. These areas are characterized by mounds of earth, stone, broken pottery and stone artifacts. Nearby are usually found the open-air art galleries of the former residents.

We call these "art galleries" advisedly, since it is not altogether certain why the ancient brown-skinned tribesmen chose the smooth surfaces of towering sandstone cliffs as places upon which to paint and peck the thousands of odd designs and realistic pictures which are found in association with the old habitation areas.

During the months of June, July and August 1946 the curator of History and Anthropology of the Los Angeles Museum was authorized by the Board of Supervisors to make a preliminary survey and study of these ancient rock pictures. The expenses of the expedition were borne by Mr. Ansel F. Hall, organizer and director of the Explorers' Camp at Mancos, Colorado.

A group of sixteen boys, ranging in age from fourteen to eighteen and assembled from all parts of the United States, were members of the expedition. Miss Barbara Loomis, formerly of the History Division at the Museum, acted as color photographer, and without her expert aid the expedition could not have been a success.

The purpose of the expedition was to study, photograph and sketch as many different types of petroglyphs and pictographs, in widely separated areas, as it might be possible to do within the comparatively short time. Ultimately it is the hope of the Museum to prepare a comprehensive exhibit of such pictures, illustrating the art of the ancient peoples as well as of their modern descendants who dwell in the same territories.

Aside from certain localized attempts to accumulate archeological data on petroglyphs and pictographs, in various states, by such men as Dr. Julian Steward, Dr. E. B. Renaud, Mr. Robert M. Tatum and Mr. A. T. Jackson, little has been done to assemble the results of such studies and present them to the American public in a graphic form. An exhibit at the Dallas Museum of Fine Arts (March 1943) of the work of Mr. and Mrs. Forrest Kirkland, professional artists, offering one hundred and eighty examples of pictographs from Texas, was a notable example of the awakening interest in the prehistoric art of the New World.

On the whole however, these scattered studies have not been made generally available to the layman. Therefore it is to be hoped that the Los Angeles Museum may be able to sponsor a New World study of the pictographic art of the Indians of North and South America, the results being presented in Museum publications and in popular reproductions of the more significant works of the ancient artists.

In effect our eventual study would be comparable to the work of Professor Leo Frobenius of the Research Institute for the Morphology of Civilization, in Frankfort-on-Main, Germany. His researches in Europe and Africa are known the world over, and his facsimile reproductions of rock drawings have been exhibited in museums throughout the United States.

Our initial survey of the past summer was conducted in the depths of Indian Creek Canyon in southeastern Utah, in the Ute-occupied territory of Mancos Canyon in southwestern Colorado, and in the Navajo-owned lands of Canyon de Chelly, Canyon del Muerto and Chaco Canyon in Arizona and New Mexico. Additional studies were made in the region of Lupton, Arizona, and on a hillside at Three Rivers, New Mexico.

The techniques used by the primitive artists were simple. They painted with mineral pigments directly upon smooth, protected surfaces of sandstone or limestone cliffs, or they pecked the designs into the surface of the cliffs or individual boulders with hard, sharp-pointed rocks. The former type of picture is termed a pictograph, the latter is known as a petroglyph.

Any interpretation of these rock pictures must of necessity be generalized, and with rare exceptions we cannot give any accurate estimate of the meaning or age of a given picture. There may be certain instances when, with the aid of modern Indians who have persisted in the practise of drawing pictures upon the rocks, we are able to obtain a fair idea of the meaning of the figures—in such as, for example, the hundreds of glyphs inscribed upon the surfaces of some large sandstone boulders to be found about ten miles west of Tuba City, Arizona. These rocks lie alongside an ancient trail which leads from the Hopi villages to an old salt mine on the Little Colorado River. This mine was worked in prehistoric times by the Pueblo Indians. For centuries it has been the custom of the various clan members of the Hopi to stop at the rocks, some twenty-five of which are covered with glyphs, and peck thereon the marks of their particular clans, such as the Sun clan, the Reed, Corn, Macaw, Rain, etc. This practise has continued well into the recent historic period. At the village of Shipaulovi, one of the modern Hopi towns, is an oldster of nearly a hundred summers who has made the memorable trek to the salt mine.



PREHISTORIC PETROGLYPH: Three Rivers, New Mexico. *Length 27 inches.*

Nowadays when the Hopi journey to Tuba City, some of them go on to the clan rocks and peck their symbols upon the dark red sandstone. Some of the same clan symbols are also to be found upon the steep sandstone escarpment near the Hopi villages.

The modern Ute and Navajo horse and sheep herders who pasture their stock in the rugged canyons of the Mancos River and in the canyons de Chelly, del Muerto, and Chaco, pass the time of day by scratching or painting pictures upon the same cliffs that their ancestors, and the ancestors of their enemies the Pueblo people, formerly used as open-air art galleries.

The latter-day artists now turn to such subjects as cowboys and cattle, horses, deer, bear and elk. Attempts at portraiture occur occasionally. Here and there one finds evidence that the younger generation have been practising their alphabet. Airplanes, wagons and automobiles are also used as subject matter. Some of these subjects are rendered with a masterly touch, but as one might expect the styles are different from those of the more ancient craftsmen. There are few of the abstract designs encountered in the works of the old cliff dwellers or basket makers, yet all of the virility of the primitive artists is found in even the simplest of the line drawings.

Occasionally, as in Canyon del Muerto where one encounters some beautifully drawn animal figures, Navajo tradition has preserved the name of the artist who made some of

the best works of this kind. A Navajo man named Little Sheep, who lived and worked in the first half of the 19th century, is currently credited with having painted the procession of Spanish horsemen at Standing Cow ruin, as well as a series of antelope at Antelope House. His touch is again seen in the figures of cattle at Standing Cow and at Twin Trails' ruin. In is our personal opinion that this same artist may also have painted the two white horsemen on a cliff below Antelope House. These latter figures, superb in action, are silhouettes of men on horseback, armed with lances and a bow and arrow (see Cover and pg. 3).

The mural depicting the procession of Spanish horsemen bearing lances and firearms is said to portray the arrival of a party of Spanish soldiery in Canyon del Muerto about 1805, at which time the invaders slaughtered some seventy-odd women and children in a cave high on the side of the canyon. The bleached fragments of their bones may still be seen in the cave, and the Navajo consider the spot tabu. The place is known as Massacre Cave, and the incident gave rise to the name of the canyon itself, which means Canyon of Death. Upon a smooth sandstone boulder sheltered by an overhanging canopy of rock in Indian Creek Canyon, Utah, are literally hundreds of petroglyphs in a wide variety of subjects, from buffalo hunting scenes to weird processions of human footprints ambling up the face of the perpendicular wall. This one rock was, perhaps, the finest single example of pictographic art encountered by the Museum expedition. Some boulders on a small hill near Three Rivers, New Mexico, also provided us with several dozen fine examples of the petroglyphic art. At this spot we found many varieties of petroglyphs ranging from geometric patterns to strange zoomorphic figures, reminiscent of the designs found upon Mimbres pottery (see pg. 5).

The Museum now possesses hundreds of 35 mm. Kodachrome pictures of the more important pictographs and petroglyphs found during the summer months, as well as several hundred black-and-white negatives of these same subjects. From this nuclear collection it is to be hoped that a more comprehensive one may grow, and that eventually we may be able to obtain like collections from Mexico, Central and South America. The possibilities are limitless, and the field virtually untouched.

—ARTHUR WOODWARD



SIMEON SOUMAIN'S "SUGAR-BOX"

Among recent additions to the Marble Collection is a silver box of unrecorded type, apparently unique in early American silverwork.¹ It shows underfoot the stamped S•S mark (thin capitals with pellet between, in a rounded rectangle) belonging to Simeon Soumain, who was one of the leading silversmiths in early New York. That it was made within the decade 1730-40 is suggested by the style of the box itself, and confirmed by a comparison with other Soumain examples that are inscribed or of known date.

If of handsome appearance, our small box achieves this effect in a quiet and well-bred, rather than a busy or pretentious fashion. Plain straight-sided oval in form, and finished with neat and sober moldings, it is snugly fitted with a double-domed lid showing a wide exposed hinge. On the lid, engraved with superior taste and skill, appears an armorial crest within a circular panel surrounded by foliation and scrollwork. Engravings in this rich style had appeared a generation earlier, during the reign of Queen Anne (1702-14), but were at their finest about 1730.

For what use, particularly in New York and at just that time, might such a box have been intended? Though the subject of old silverwork, both English and American, has been

¹L.1023-368—base $3\frac{3}{4}$ by $5\frac{1}{4}$ inches, height $3\frac{3}{8}$ inches. Other examples from Mrs. John Emerson Marble's collection have been published in the *Museum Quarterly* for April 1941, the *Magazine Antiques* for March 1937 and May 1940, and the *Connoisseur* for March 1944.

thoroughly explored for many years, this box of Soumain's is like nothing yet recorded for its period.

We may at once reject the idea that this piece originally formed part of a toilet-service. For the dressing-tables of their noble and wealthy patrons, the English silversmiths (especially the Huguenot workmen) from Charles II to Queen Anne had made vast and splendid suites consisting of a crested mirror and candlesticks, boxes and bowls in various sizes, vases and *tazze* and trays, "all of massie siluer and out of number." In our own box we are at first reminded of the round, square or octagonal boxes in pairs that usually accompanied these toilet-services. But the Restoration fashion for such showy equipages had passed with the turn of the century; and even when they were the *dernier cri* in England, no Colonial establishment had affected anything so grand.

It is true that when recently found, here in California, our box was being used on a dressing-table—but in sadly fallen estate, as an everyday convenience for prosaic baby-powder! Nevertheless, continuing a tradition in the family, it was still known as "the sugar-box." What might this mean?

Of what we now call the "sugar-boxes" made by American silversmiths, only seven or eight have survived. All are quite similar, all by makers in or near Boston (John Coney and Edward Winslow among them), and all of the period about 1690-1725. They closely follow English models of the time of Charles II, and in no way resemble Simeon Soumain's box. Somewhat larger than his (eight or nine inches long) and plain oval or lobed, their low-slung bodies rest on inadequate scroll feet, and show a bold decoration of repoussage and cut-cardwork that makes Soumain's poor box look timidly plain indeed!²

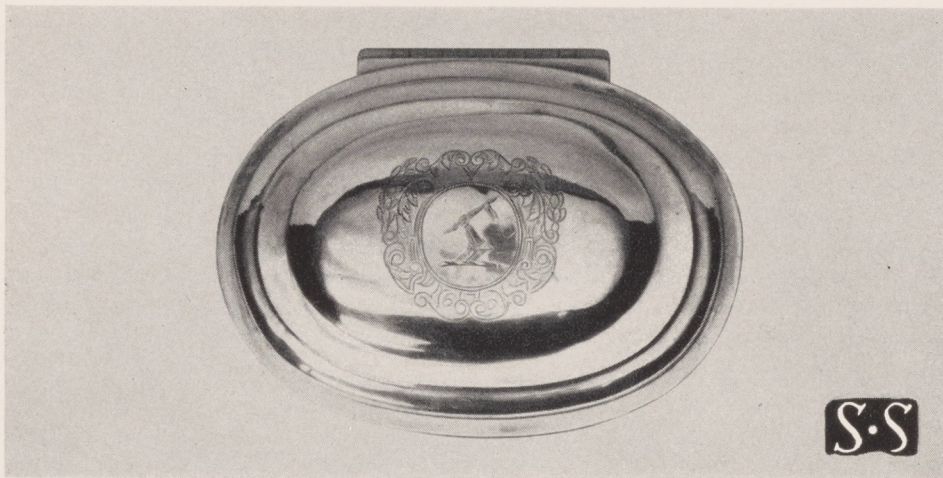
Despite their name, these boxes were not for *sugar* as we now know it, at all—not for the "Powder and Household sugars" advertised in Boston in 1712, or the "sugar, double-refined, at 3.s per lb. by the loaf" in 1724, or for "all sorts of fine clay'd, powder, and muscovado Sugars" offered in 1736. Also called *sugars*, at that time, were the "wet sweetmeats" (such as Chinese ginger in syrup) sold in 1710/11 by Zabdiel Boylston, the "Sugar-candy, brown and white" in 1732, the downright "candid Citron" in 1734, or the ickily alluring "Maqueroons, candied Fruits and dried in their Colours, Rock-candy upon them" with which Peter Lorent, Confectioner and Distiller from London, beguiled the Boston goodwives. It was for sweets such as these—for "Sugar confect and Sugar Plumbs"—that the Massachusetts sugar-boxes were made.³

But we cannot suppose it would have occurred to Simeon Soumain to make a box of this kind for sweetmeats. Probably he never saw one of the New England pieces. In New York, a distinctive type of Dutch-style bowl, shallow and lobed or six-paneled, with two S-scrolled handles, was being made by such men as Jacob Boelen, Benjamin Wynkoop, and many others including Soumain himself.⁴ The larger sizes were baptismal basins; but the smaller ones, though made to be used as "porringers" (for eating porridge), undoubtedly served sometimes for dry *sugar* (as we know it) and *sugars* ("wet" sweet-

²A typical example by Coney is shown p. 399 in *Historic Silver of the Colonies and Its Makers*—Francis Hill Bigelow (1931).

³The quotations are from early advertisements in *The Arts & Crafts in New England, 1704-1775*—George Francis Dow (1927).

⁴Several examples are pictured in the exhibition catalogues *Early New York Silver* by C. Louise Avery (Metropolitan Museum of Art, 1932), and *Silver by New York Makers* by V. Isabelle Miller (Museum of the City of New York, 1937).



meats and candies) as well. A number are still to be found; and it was this form, rather than any sort of box with a hinged lid, that would have been familiar to Soumain.

Nor does our oval box fit the expectancies if it was intended for sugar on the tea-table. For this purpose, at the time our box was made, footed round bowls with separate covers were already appearing and were soon in general use.⁵ Since Soumain was one of the better-known silversmiths, and patronized by persons of fashion, he would surely have followed this newer form rather than one strange or outmoded.

If, as it then seems, his box was not really for sugars either "wet" or dry, to what other use can we assign this curious piece of Soumain's? A hint may perhaps be found in a much-quoted New York advertisement of 1727, concerning a great lottery "for £501 of Silver and Gold work, wrought by *Simeon Soumain of New York, Gold-Smith*, all of the newest Fashion."⁶

"There is 278 Prizes in all," we are grandly told. "The highest Prize consists of an Eight square Tea-Pot, six Tea-Spoons, Skimmer and Tongues, Valued at £18 3s. 6d." The teapot no doubt resembled a famous contemporary piece by Peter Van Dyck, now the only surviving American example of an octagonal pot in the small pyriform shape that was typical of the period.⁷ The "skimmer" would have been a spoon with pierced bowl (now usually called a mote-spoon), used for straining the tea and for removing unwanted bits that floated in the teacup. The "tongues" were of course sugar tongs—probably, at this early date, of scissors form rather than the later U-shaped kind with curved bow. And the teaspoons were surely of the Hanoverian style then fashionable: blunt-bowled, with upturned handle showing a thickened midrib, and perhaps with a plain "rat-tail" to

⁵Miss Avery (*op. cit.*, Figs. 5 and 67) shows early examples by Adrian Bancker and Simeon Soumain. With these compare the later models by John Brevoort and Nicholas Roosevelt, Figs. 24 and 62.

⁶Given in full by Bigelow (*op. cit.*, pp. 88-9).

⁷Miller, No. 340 (*op. cit.*, p. 70).

reinforce the back of the bowl. Eight such spoons and a matching "skimmer" spoon, all of gold, and by Soumain himself, are pictured by Miss Miller.⁸

Is a logical use for Soumain's oval box suggested here? For it is of exactly the right size and sort to accommodate a set of these small spoons, together with a skimmer and "tongues." Its moldings, we notice, duplicate those on the foot and cover of the Garvan Collection sugar bowl by Soumain, mentioned before,⁹ and the two pieces would companion beautifully.

True, no mention of other spoon-boxes have we found. But in that early time when tea was still so choice that the teapot and other vessels were kept small, and tea caddies were often equipped with locks, it would have been most appropriate to provide a special container for safekeeping of the little spoons and their fellow gadgets—especially if they be of solid gold!

⁸*Ibid.*, p. 64—No. 288, length 4 and 4½ inches.

⁹Avery (*op. cit.*, Fig. 67)—inscribed for Elizabeth (Harris) Cruger, who married in 1736.

THE MAKER¹⁰

Simeon Soumain, born 1685 in London, where on June 10th of that year he was baptized in the Threadneedle Street Huguenot Church, was the son of French refugees, Simeon and Jeanne (Piaud) Soumaine. The family was in New York by April 1689 or earlier.

Here they found many compatriots, one-quarter of the New York population then (1688) being of French extraction, and public documents therefore appearing in French as well as Dutch and English.

Soumain lived and worked in New York the rest of his life, becoming a principal figure in his craft and the holder of many public offices. He married Mary Burt sometime between 1702-12, and six of their children are mentioned on a *Simeon Soumain* footstone at Trinity Church, where Simeon was a vestryman from 1712-50.

His younger brother Daniel, born 1697 in New York, became the father of Lieutenant Simeon 3rd (who, on the Braddock expedition, was killed in 1755 at the battle of Monongahela), and of the silversmith Samuel (c.1718-c.1765) who worked 1740-54 at Annapolis and 1754-65 at Philadelphia.

Simeon Soumain took as apprentices William Anderson Jr. in 1719 and Elias Boudinot in 1722, with Elias Pelletreau as late as 1741. His own period of activity was chiefly during the period 1720-40, though in 1745 he was still mentioned as "goldsmith, near the Old Slip Market in New York." It is believed that his death occurred five years later, though definite records have not come to light.

Surviving examples of Soumain's work, while rare, have been recorded in numbers sufficient to show that he was a craftsman of the highest skill and versatility. Sometimes he followed the peculiar New York Dutch taste—as in the six-paneled, two-handled bowl mentioned before, or in a fine mug and tankard with rich engraving and the typical

¹⁰Published information on Soumain is meagre and scattered, and shows disagreement on important points. For these amplified and corrected notes we are in part greatly indebted to Mrs. Russel Hastings of Santa Barbara, who graciously permitted access to her original research files.

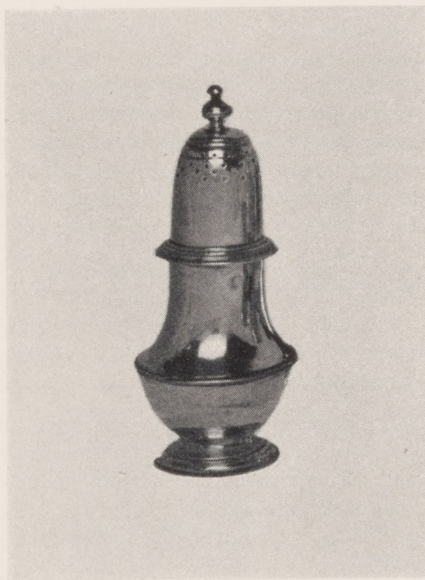
decorative band of cut-card leafage above the basemold. Or again, he employed a restrained and purely English style (of the much earlier Charles II period) in his handsome communion flagon for St. Peter's Church at Perth Amboy. His pieces were at one time so severely plain as the baptismal basin (1735) for St. George's Church in Hempstead, or at another so tastefully elaborated as a (somewhat later) shell-footed salver with molded "piecrust" edge. Whether working in the Dutch, French or English styles he seems equally accomplished.¹¹

Caution must be observed in giving to Simeon Soumain pieces that show a stamped double-S mark. Quite similar marks are attributed to Simon Sexnine his contemporary and fellow townsman, to his nephew Samuel Soumaien of Annapolis and Philadelphia, and even to Silas Sawin who worked in Boston a century later.

For the spelling of his name there is little fixed authority. In his own time he was known as both Simeon and Simon, and surnamed Soumain or Semine or Soumaien. Sometimes he appears as Soumine or Soumaine or Soumien. His nephew Samuel was called Soumaien in Annapolis but Soumain in Philadelphia. Such quibbling differences bothered nobody, however, in a day when Carol Van Brugh and Cornelius Vanderburgh were the same man! Today, most writers prefer the spelling *Soumain*, but the choice is rather arbitrary.

—GREGOR NORMAN-WILCOX

¹¹His close contemporaries in age were such well-known makers as Charles Le Roux, a Huguenot, and the Dutch silversmiths Peter Van Dyck and Koenraet Ten Eyck.



SIMEON SOUMAIN—Silver caster by the same maker, also in the Marble Collection. *Height 5½ inches.*

TOADSTOOLS ARE MUSHROOMS

With the onset of our rainy season, we see countless kinds of mushrooms here, there and everywhere. Many of us wonder what they are, where they come from, and whether they are good to eat. Botanists are often asked: "How did these queer-looking plants happen? They weren't there yesterday, but this morning when I went out into my yard there they were, in the middle of my lawn!"

To one whose knowledge of plants is limited to the trees and shrubs of parks and gardens, the herbaceous plants of indoor cultivation, and the grasses of limited plots and lawns, it may be surprising to learn that "toadstools" and mushrooms are plants, too. Most of the plants we are familiar with have parts that are conspicuously green. This color is due to the presence of a substance called chlorophyll, which is among the most important in the world because by means of it green plants are able to manufacture starch and sugar from the carbon dioxide they take out of the air and the water they draw from the soil. The by-product of this manufacture is oxygen, which is given into the air by the plants. In this way, green plants replace the oxygen removed from the air by man and the animals. But not so the mushrooms, which are more simple plants. Having neither roots, stems nor leaves, and having no chlorophyll, they are unable to manufacture food from the air and water, and are therefore dependent upon green plants, just as we are. All of the mushrooms belong to a group of plants called Fungi. Some of them take their food from living plants or animals, and so are called parasitic fungi. Many such parasitic fungi cause serious diseases in plants and animals. Others obtain their nourishment from the dead remains of plants or animals, and are therefore called saprophytic fungi.

All the fungous plants produce fruits just as the green plants do, but these appear in a different way. There are thousands of kinds that produce fruits too small to be seen without the aid of a microscope—for example, those that form the mold on bread or the green and blue mold on lemons and oranges. But there are other fungi that have fruits large enough to be seen readily. Some of these are the puffballs, mushrooms and "toadstools" that appear in lawns, along roadsides, or in our parks. What we see is the fruit, rather than the plant.

The fungous plant itself, which produces these strange-looking fruits, is a mass of fine, white, threadlike material amongst the dirt particles of the soil. This threadlike substance, called mycelium, is usually not seen. When conditions are right, that is, when the plant has proper food, moisture, and temperature, it quickly produces its fruit, often in less than twenty-four hours. That is why "toadstools" appear in our lawns overnight.

The fruiting structure of the mushroom, as in all fungous plants, has "seeds" in the form of a fine powdery substance called spores. When the fruit has matured it discharges its tiny spores into the air, and when these come to rest upon suitable substratum they germinate into fine, threadlike material (mycelium) and the cycle of growth and fruiting begins again. After the ripe fruit has discharged its spores, it disintegrates and disappears almost as rapidly as it appeared.

Generally, fungi are beneficial to the soil because they help to break down bits of wood, dead leaves, and other organic particles, thereby releasing much-needed nitrogen into the

soil. However, when fungi occur on the trunks of trees they are an indication that the trees are diseased and will sooner or later die.

One of the worst of all tree fungi is the Honey-colored Mushroom (*Armillaria mellea*), often called the Oak Root-rot Fungus because it frequently occurs at the base of oak trunks. Its effect upon a great variety of trees is deadly in the extreme. The plant or vegetative part of the fungus, the mycelium, working on the tree roots and the sap-wood under the bark, soon kills the tree. Indeed, the tree is often doomed before one even suspects that it is affected. It is only when the fungus puts forth its fruit, a cluster of honey-colored or almost white umbrella-shaped mushrooms at the base of the tree trunk, that one is aware the tree is diseased.

Every botanist is frequently asked how to tell a mushroom from a toadstool. Actually, there is no difference. Every fungus that produces a fleshy, spongy, woody, or jelly-like fruit body, large enough to be seen without a microscope, may be called a mushroom or, if it is stool-shaped, a toadstool. Many people distinguish the poisonous mushrooms from all the others by calling them "toadstools." But since many of the edible mushrooms are of stool-like form too, the question should really be: "How can I tell the edible from the poisonous mushrooms?"

There are hundreds of kinds of mushrooms, very many of them edible, and many not edible, but only a few poisonous. Those that are harmless but inedible are either tough or woody, or just unpalatable. This can be determined only by tasting. But to distinguish the really poisonous from the edible ones, we must learn the botanical characters of both, and learn them so well that we recognize the various kinds at sight—as readily as we recognize the members of our own family. There are no reliable tests. The "silver" test, "salt" test, "peel" test and many others have often proved fallible.

Mushrooms develop into cup-shaped, saucer-shaped, club-shaped, ball-shaped and saddle-shaped forms. Some look like corals, funnels, fans or paddles. Some occur in shelf-like or layer-like masses, while the ones with which we are the most familiar show an umbrella-like form. In their odors they vie with the fragrance of flowers, or are as obnoxious as carrion, skunk, or rotting fish. Their flavors are difficult to describe, since the sense of taste differs in individuals, but they can be generally classed as mild, sweet, sour or peppery. The texture of mushrooms may be woody or leathery, spongy or velvety, fleshy or jelly-like. Some kinds exude a watery or milky juice; some turn a brilliant color when bruised; and some exhibit a luminescence when seen in the dark. The Honey-colored Mushroom (mentioned above) is one of those that glow at night. In removing the bark from rotting logs, bright flashing areas of its mycelium may be uncovered. Its fruit-bodies, however, are not luminescent.

Colors are associated in our minds with flowers or with the gay plumage of birds. It is not commonly realized that mushrooms offer a range quite as rich and varied. For example, all shades of red to pale pink are to be found in a group known as the Russulas. Orange hues may be seen in their full glory in such kinds as Caesar's Mushroom (*Amanita caesarea*), an *Amanita* that is edible. Yellows occur in all tints. Even green, so rare a color in mushrooms, is to be found in several kinds, one of which stains the wood upon which it grows a beautiful shade of this color. Blue, nearly as rare as green, occurs in a few species. Lavender and violet, in various shades and tints, appear in several kinds; but black, that is jet-black, is known in only one group of mushrooms. White appears in many groups, including the field and table mushroom as well as the notoriously poisonous, angelic-looking *Amanita* with such deeds of the devil to its account.

To know the characters of the edible kinds, and to avoid those that are poisonous, let us examine the structure of a mature mushroom of umbrella type—the form in which most of the edible as well as poisonous kinds occur. We find such a mushroom has a stalk or "stipe," and an expanded portion called the cap or "pileus." The under side of this cap may have teeth, spines, pores, tubes or plates (gills, as they are usually called) which contain the seeds or "spores." Mushrooms produce spores in many colors: pink to salmon, yellow to rusty brown, dark brown to purple, black or white. Occasionally, green-spored kinds are found. The color of its spores is one of the characters determining whether a mushroom is edible or poisonous. But because very many similar mushrooms have different colored spores, and because the deadly *Amanita* is often mistaken for the table mushroom, it must be remembered that the poisonous *Amanita* always has *white* spores while the

STAGES IN THE DEVELOPMENT OF THE TABLE MUSHROOM

A—Mature mushroom (*Agaricus campestris*), showing its short and squatty structure, slight soft ring, and stem with tapering base. Note that base is not bulbous, and is always devoid of any trace of crumbs, scales or bag.

B—Longitudinal section, showing gills of unequal length and free from the stem. These gills bear the spores, which are at first pinkish but turn purplish brown at maturity. The stem is usually solid.

C—Button stage, showing partial veil (annulus) beginning to rupture at edge of the cap. Mushrooms are best to eat at this stage.

D—Bud stage, with (above) longitudinal section illustrating the lack of the universal veil, or volva.



STAGES IN THE DEVELOPMENT OF THE DEADLY AMANITA

A—Bud stage, at which it may be confused with a puffball. If, when cut in two, it shows inner structure such as the upper sketch, it is certainly not a puffball, which is generally characterized by a homogeneous mass. Note that the universal veil (volva) covers the whole bud.

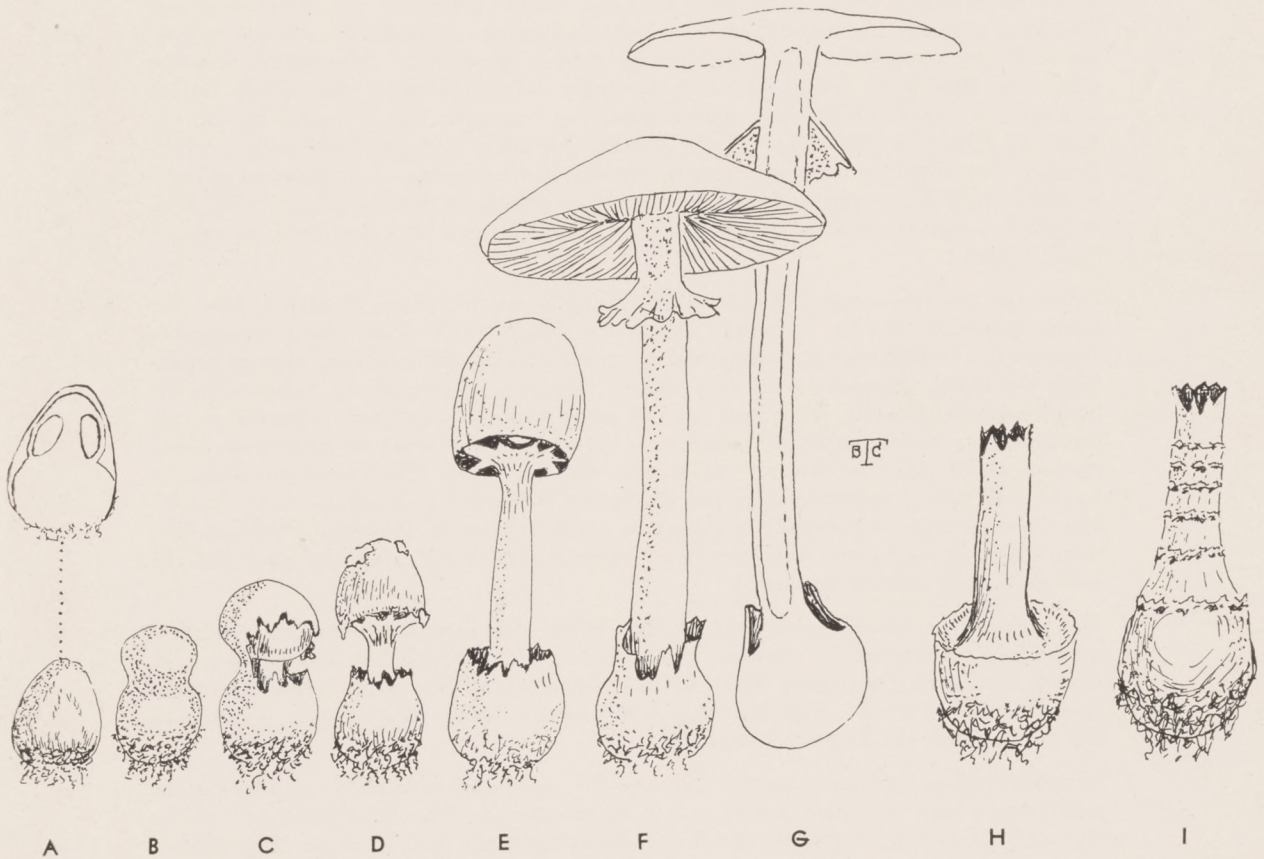
B—Button stage. In C, the universal veil is beginning to rupture, exposing part of the immature mushroom.

D shows a more advanced stage, with complete rupture of the veil, formation of the volva or cup at the base, and shreds of the volva remaining on top and edge of cap. Note that the partial veil or annulus, under the cap, is still intact.

E—Semi-mature stage, showing annulus beginning to rupture. This forms the ring in the mature stage (F). Note that shreds of the volva have disappeared from the cap, though in some species these remain throughout the life of the mushroom.

F—Mature mushroom, *Amanita Phalloides*. In our region this kind is frequently found under oak trees. Sometimes it shows only fragmentary remains of the volva. The longitudinal section G shows gills attached to the stem, hollow stem, and enlarged base.

H, I—Examples of the enlarged base in two other poisonous Amanitas.



other has spores that are at first pink but later, when it matures, become blackish-brown. A short distance below the cap, there may be a ring-like structure around the stalk of the mushroom. This is often called the "annulus." If our mushroom is an *Amanita* it will also have a cup-like structure, the "volva," at the base of the stalk. This cup is often beneath the top of the soil, so mushrooms being gathered for eating should be carefully dug up. The cup, which is a character of the poisonous mushroom, may remain in the ground unseen if the fruit is merely pulled out.

Therefore, if a mushroom is one of the dangerously poisonous kinds it will have a cap with gills bearing white spores; it will have the ring or annulus (this may disappear, so we look for remnants); and it will have a volva (cup or bulbous base). Some edible kinds have a volva but no ring, and many have neither ring nor volva but have gills with white or colored spores. Only in the deadly *Amanita* are all four characters present.

Frequently, mushroom-poisoning is due to the eating of unwholesome specimens. No one would think of eating meat that was infested with larvae (maggots). Then to be sure that what we prepare for eating are wholesome, they should be sliced to determine whether they are infested, and then placed in salted water for a few minutes. Individual mushroom-poisoning may be due to special allergies, and is not serious.

There are several types of mushroom-poisoning, mainly caused by the *Amanita* group. The most serious is the choleriform type—serious because symptoms do not appear until ten to fifteen hours after eating, and because there is no antidote. The Deadly *Amanita* (*Amanita phalloides*) and the Destroying Angel (*Amanita virosa* and closely related species) are responsible for this type of poisoning. Another type is caused by the Fly *Amanita* (*Amanita muscaria*) and the Panther *Amanita* (*Amanita pantherina*), which produce their effect on the nerves almost immediately after eating. A complex of poisons, of which muscarin is apparently the most active, is present in these two fungi. The drug atropin is a perfect antidote, but should be administered by a physician since the drug is itself a poison.

Other rare or minor types of mushroom-poisoning are the Blood-dissolving type, the Gastro-intestinal, and the Cerebral. The first is caused by the False Morel (*Gyromitra esculenta*), a fungus with a chestnut-red cap with brainlike convolutions, vaguely resembling the Morel. Blood transfusion is usually suggested. Although the False Morel has been known to be deadly, it has been eaten by many people who suffered no trace of serious consequences. Gastro-intestinal poisoning is caused by several kinds of mushrooms which produce no ill effect in most of the persons who eat them. The symptoms terminate rapidly and usually spontaneously, and the victim is restored to health in a day or two. The Cerebral type of poisoning is caused by several species of *Panaeolus*. Exhilaration, staggering gait, and queer disturbances of vision appear shortly after the meal, but the individual soon returns to normal.

Not always have poisonous mushrooms been eaten with innocent intention. And few species have as interesting a history as the Fly *Amanita*, which has been notorious in records from the earliest times. Pliny, in his famous *Natural History*, tells how Agrippina brought disfavor on the mushroom as a dainty food by using the poisonous *Amanita* to kill her husband, the Emperor Claudius.

Notwithstanding its fatal character, this same Fly *Amanita* is habitually eaten by certain peoples, to whom its poison simply acts as an intoxicant. The "berserker rage" of the ancient Teutons was induced by drinking a concoction made from its juice. It is custom-

arily employed as a narcotic and exhilarant in Kamchatka and Asiatic Russia, where the Amanita drunkard supplants the opium fiend or alcohol dipsomaniac of other countries. The Siberians steep dried specimens of the Fly Amanita in whortleberry juice, to make a drink which produces an intoxication similar to that of the "haschisch" of the East. On special, festive occasions (at weddings and the like) the entire population of a village indulges in an Amanita debauch. Individuals intoxicated from drinking the liquid run amuck, with false courage and insane action, often with disastrous results.

—BONNIE C. TEMPLETON

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